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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,776	10/20/2003	Kyung Su Chae	0465-0990P	9604

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BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER	
MILLER, MICHAEL G	

ART UNIT	PAPER NUMBER
1712	

NOTIFICATION DATE	DELIVERY MODE
08/18/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/687,776	CHAE ET AL.	
	Examiner	Art Unit	
	MICHAEL G. MILLER	1712	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 June 2011*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4,7,11,12 and 15-23* is/are pending in the application.

4a) Of the above claim(s) *15-22* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,7,11,12 and 23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1) A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 20 JUN 2011 has been entered.

Response to Amendment

2) Examiner notes the amendment filed 20 JUN 2011. As a result of the amendment:
   a) Claims 1, 4, 7, 11-12, and 15-23 are pending.
   b) Claim 1 is amended.
   c) Claims 2-3, 5-6, 8-10, 13-14 and 24 are canceled.
   d) Claims 15-22 are withdrawn.

Response to Arguments

3) Applicant's arguments filed 20 JUN 2011 have been fully considered but they are not persuasive.
   a) Applicant argues that the art currently of record does not fairly teach a process wherein an alignment material is sprayed across the entire surface. Examiner disagrees, noting that the claims are drawn to a device, in which an inkjet printer is explicitly claimed. An inkjet printer is inherently capable of printing over an entire surface.

b) Applicant argues that since the robot of '384 is taught as only lowering the substrate to the conveyor, there is no reason to expect that the robot could lift the substrate in the drying part. Examiner respectfully disagrees, noting that since the robot has to then elevate itself in order to be in position to remove the next substrate, the robot is certainly capable of elevating the substrate from a lower position to a higher one. Further, as the hand of the robot has a finite thickness, the act of slipping the hand under the substrate inherently would raise the substrate to a higher portion of the printing part for transport to the drying part.

Claim Rejections - 35 USC § 103

4) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5) The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

(1) Determining the scope and contents of the prior art.
(2) Ascertaining the differences between the prior art and the claims at issue.
(3) Resolving the level of ordinary skill in the pertinent art.
(4) Considering objective evidence present in the application indicating obviousness or nonobviousness.

6) This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7) As these claims are drawn to a device, portions of the claim which do not define physical structure will be given limited patentable weight to the extent that they provide requirements that the device must be capable of.

8) Claims 1, 4, 7, 11-12 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satoi (US Patent 6,331,384, hereinafter '384), Fairbairn et al (US Patent 6,176,667, hereinafter '667) and Kagawa et al (U.S. Patent 6,265,034, hereinafter '034).

9) With regard to Claim 1, '384 teaches a device usable for forming an alignment layer of a display apparatus, the device comprising alower portion and an upper portion of the device usable for forming the alignment layer:

   a) Wherein the lower portion includes a printing part (Column 12 Lines 36-64, specifically the stage 52) including a printing process to form the alignment layer on a substrate, and including a print table fixing the substrate (the stage 52) and at least one inkjet head to spray an alignment material onto the substrate (Column 12 Lines 36-49 specifically); and

   b) Wherein the upper portion includes a drying part (Column 13 Lines 1-15, specifically referencing heating apparatus 208) the drying part including a drying

process to dry a solvent of the alignment material onto the substrate using a dry table having a hot plate ('384 Column 10 Lines 62-65 teaches an oven; Column 9 Lines 47-50 teach that hot plates and hot-air ovens are interchangeable in this process), a baking process to bake the dried alignment material onto the substrate (as above, since any fixative process will be hot enough to dry the solvent out as the baking proceeeds);

c) A transferring part having a transfer robot lifting the substrate to a higher height of the printing part in a vertical direction ('384 Column 14 Line 60 – Column 15 Line 27 details a robot capable of motion in the vertical and radial directions of cylindrical coordinates; choosing a robot for this transfer would be one of a finite number of choices that a person skilled in the art would be able to choose between with a reasonable expectation of success)(Column 14 Lines 36-49 discussing conveyors and robots) for transferring the substrate from the printing part to the drying part (Column 18 Lines 38-45 teaches that the units can be individual modules with substrates transferred individually; it would be a matter of design choice to control the order in which substrates are transferred between modules), and placing the substrate on the dry table after the printing process (as above);

d) Wherein the at least one inkjet head ('384 Column 12 Lines 36-49) is positioned above the printing part ('384 Figure 7 shows the inkjet head above the printing part), and wherein:

e) At least one array of inkjet heads is positioned in one line according to a long side or a short side of the substrate (‘384 Column 19 Lines 42-49) to print the alignment layer onto the long or short side of the substrate at one time.

f) ‘384 does not explicitly teach a coating step wherein an alignment layer is sprayed completely across a surface of the substrate. However, Examiner notes that the claim is drawn to a device, and that the limitation of using the device to print across the entire surface of a substrate is a statement of intended use only. It provides no structure to the claimed device. ‘384 teaches an inkjet head as described above; inkjet heads are inherently capable of providing coatings across entire surfaces given proper programming.

g) ‘384does not teach that the drying part is disposed directly and vertically above the printing part. However, ‘384 teaches that its linear embodiment is only exemplary and that the units can be individual with substrates transferred individually (Column 18 Lines 38-45). ‘667 teaches that stacking process chambers above each other can reduce the floor space needed for a process, allowing for more efficient use of space. This speaks to a problem stated by Applicant of more efficiently using clean room space. Further, '667 shows a pair of enclosed modules aligned directly over/under each other (Figure 1, items A1 and A2; Column 3 Lines 11-19). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified the apparatus of ‘384 by adding the teaching of ‘667 to stack the portions of the apparatus because ‘384 teaches that the portions of the

apparatus can be modular and '667 teaches that stacking modular apparatuses improves the optimization of floor space.

h) As far as the limitation of disposing the drying part above the printing part, this claim would have been obvious because a person of ordinary skill has good reason to pursue the known options with his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. In a stacked system consisting of a printing part and a drying part, there are two permutations that these can be stacked in (e.g., drying over printing and printing over drying). One of ordinary skill in the art could have chosen from either of these options with an equally reasonable expectation of success. '384/'667 discloses the claimed invention except for the relative location of the drying and printing parts. It would have been an obvious matter of design choice to locate the drying part directly and vertically above the printing part, since it has been held that rearranging parts of an invention only involves routine skill in the art. *In re* Japikse, 86 USPQ 70.

i) '384/'667 teaches a print table to receive the substrate and an inkjet head ('384 Column 12 Lines 36 – 51, talking about moving a print stage and driving an inkjet head assembly); as each of these parts can be moved independently, the apparatus can function by or by moving the inkjet over the stationary substrate. The references do not teach a preferred direction of motion; however, the claim would have been obvious because "a person of ordinary skill has good reason to pursue the known options with his or her technical grasp. If this leads to the

anticipated success, it is likely the product not of innovation but of ordinary skill and common sense." There are three classes of linear planar motion possible – horizontal and parallel to a defined axis, horizontal and perpendicular to a defined axis, or transverse to a defined axis.

j) '384/'667 are silent as to a rubbing process. It is noted that '384 envisions its product to be used in context with an alignment layer as discussed above. '034 teaches a method of forming an alignment layer on a color filter substrate and then baking and rubbing the alignment layer for use in a liquid crystal application (Column 10 Line 59 - Column 11 Line 6). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have combined the inventions of '384/'667 and '034, as both methods want to apply alignment layers to color filter substrates for use in liquid crystal applications and '034 teaches a method suitable for the purpose.

10) With regard to Claim 4, '384/'667/'034 teaches the device of claim 1, wherein:

a) A size and an arrangement of the inkjet heads are varied according to a size and a kind of the substrate ('384 Column 8 Line 62 – Column 9 Line 26; if a mono-color filter is desired, all the print heads print one color as discussed in Column 18 Lines 46-49; and the width of printing is determined by the maximum width of the substrate as discussed in Column 19 Lines 42-49).

11) With regard to Claim 7, '384/'667/'034 teach that the coatings are applied by inkjet deposition. Polyimide PI is capable of being deposited by inkjet and therefore the device taught in claim 1 is capable of meeting the limitation of claim 7.

12) With regard to Claim 11, it is well known in the art that alignment layers can be provided in LCD devices (as provided in Claim 1 above in '384 and '034). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have used a device capable of printing alignment layers for the purpose of printing alignment layers in LCD devices.

13) With regard to Claim 12, '384/'667/'034 teaches that it is known to manufacture electronic components in clean rooms ('667 Column 1 Lines 5 – 30).

14) With regards to Claim 23, '384 Column 19 Lines 42-49 discuss the concept of an inkjet head having a width equal to that of the substrate.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL G. MILLER whose telephone number is (571)270-1861. The examiner can normally be reached on M-F 9-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on (571) 272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http:/pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MICHAEL G MILLER/
Examiner, Art Unit 1712

/Michael Cleveland/
Supervisory Patent Examiner, Art Unit 1712